

A Feasibility Study of Diverting Aircraft Operations at East Hampton Airport

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Harris Miller Miller and Hanson, Inc.

- HMMH is an internationally known environmental and transportation engineering firm founded in 1981
- Company mission is to provide solutions to environmental challenges, including noise, airspace, and airport problems
- We provide services ranging from basic noise assessments to innovative analyses of unique airport concerns and problems
- Have assisted HTO with annual assessments of noise complaints and operations since 2015



Agenda

- Purpose
- Diversion Airfields
- Data Sources
- Methodology and Data Reduction
- Diversion Airfield Results
- Options for East Hampton Limitations
- Summary

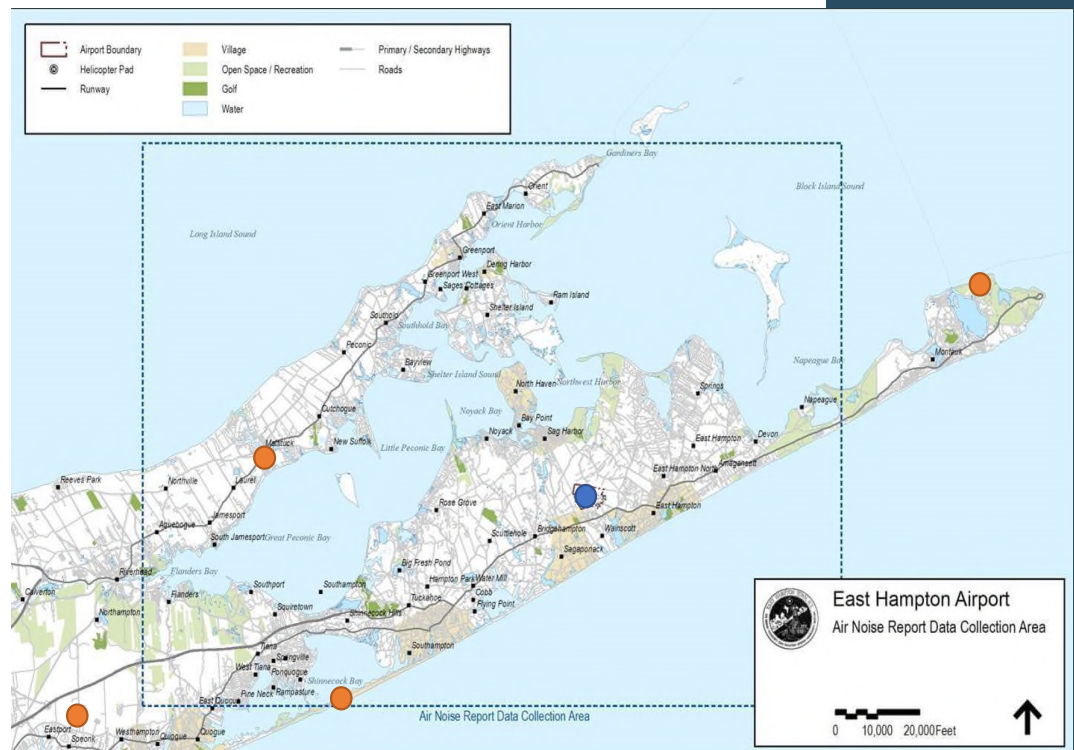


Purpose

- Airports that receive Federal funds for development and improvement must comply with grant assurances and other laws
 - These assurances do not allow such airports to restrict flight operations
- East Hampton Airport's Federal grant assurances expire this month
 - This expiration would allow the Airport to close or restrict operations
- This study looks at historical operations at East Hampton and how such operations could be redistributed to four nearby airports and airfields if East Hampton were to close or limit operations

Potential Diversion Airfields

- Four nearby airports/airfields were selected as candidates to accept flight operations from East Hampton Airport
 - Francis S. Gabreski Airport (FOK)
 - Montauk Airport (MTP)
 - Mattituck Airport (21N)
 - Southampton Heliport (87N)
- Selected based on proximity to HTO



Other Nearby Airfields



Source: skyvector.com

- Rose Field: privately owned; 1,100 ft turf runway
- Westmoreland: privately owned; 2,100 ft turf runway
- Foster Farm: privately owned; 1,900 ft turf runway
- Calverton Executive: publicly owned but private use
- Private airports usually require prior permission from the owner
- Also are not required to report usage to the FAA

Data Sources

- Historical flight operations data from East Hampton Airport (VNOMS)
- Aircraft-specific data (FAA, aircraft manufacturers)
- Airport and airfield data (FAA, airport websites)
 - FAA Form 5010 data for each airfield
 - FAA Instrument Approach Procedures
 - FAA Traffic Flow Management System Counts (TFMSC)
- Meteorological data (NOAA)
- Other data
 - Satellite photos
 - Airport websites
 - Economic analysis study (HR&A, Inc., May 2021)

Methodology

- Synthesized requirements and restrictions associated with each airfield that could limit the number and types of operations from East Hampton that could feasibly occur
 - Resulted in a quantitative analysis of East Hampton's operations with respect to each airfield
- Primarily considers whether an operation, considered by itself, could occur at an airport with the relevant restrictions and limitations applied
- Then estimated an airfield's capacity based on current data for current and potential future conditions
- Lastly, considered non-quantifiable factors that could affect the number of operations

Data Reduction

- How did we determine which operations could occur at a diversion airfield?
- Data reduction and analysis performed to estimate:
 - Runway length requirements at each airport
 - General daily weather conditions at each airport
 - Wind speed and direction
 - Ceiling and visibility
 - Crosswind estimates
 - Aircraft crosswind limit estimates
 - Touch and go operations
 - Potential aircraft parking needs

Data Reduction: Runway Length

- Runway length requirements determined by aircraft operating manuals and the type of flight (general aviation, charter, air carrier)
 - An analysis of this detail was beyond the scope of this activity
- Used the method described in FAA Advisory Circular 150/5325-4B, *Runway Length Requirements for Airport Design*
 - Uses airport altitude and temperature, plus aircraft approach speed, MTOW, and/or number of passengers to estimate runway length

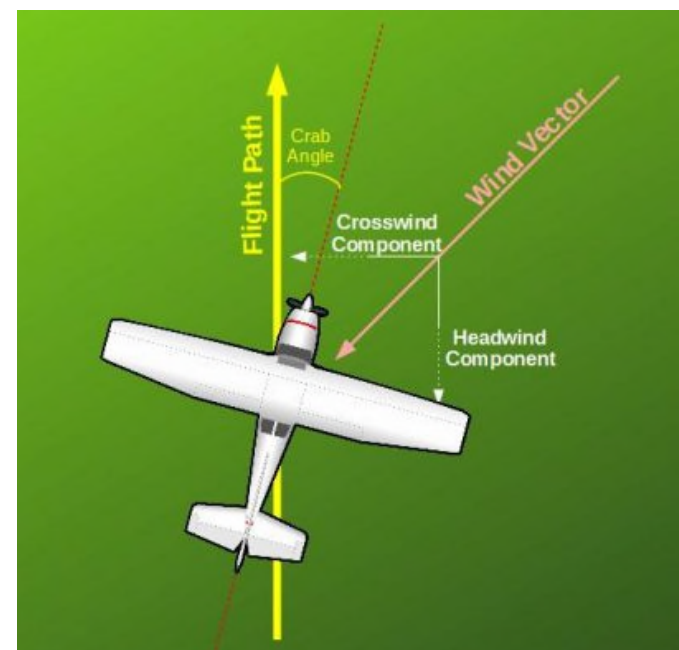


Data Reduction: Weather Conditions

- Averaged the hourly reports to create estimated daily values for wind speed, direction, visibility, ceiling
 - For airports without their own weather stations, we used data from the relevant nearby weather stations
 - Pilots would usually choose the more limiting conditions, but choosing the less limiting values (e.g., higher ceiling/visibility) provides a more conservative (higher) estimate of operations that could divert to other airports
- Used visibility and ceiling daily estimates to determine if the airport is in Visual Flight Rules (VFR) or Instrument Flight Rules (IFR) conditions
- An additional consideration not accounted for here would be the actual conditions at an airport—do weather reports accurately represent the weather at the airfield?
- Possibility of coastal weather effects coupled with limited Instrument Approach Procedure capability could further limit operations

Data Reduction: Crosswinds

- Calculated the difference between the daily estimated wind direction and runway headings to determine possible crosswind angles
 - Selected the smallest value
- Then used daily estimated wind speed and estimated crosswind angle to estimate a crosswind component speed for each day
- Also used aircraft stall speed to estimate each aircraft model's maximum crosswind component
 - According to FAA AC 23-8C, *Flight Test Guide for Certification of Part 23 Airplanes*, aircraft must be able to handle crosswind components equivalent to 0.2 times the stall speed
- If an airfield's estimated crosswind component exceeded an operation's maximum crosswind limit, we assumed that operation could not occur at that airfield
- Crosswind components are usually specified in aircraft operating manuals, but such a data collection effort is beyond this scope



Source: gleim.com

Data Reduction: Touch and Go Operations

- Defined a touch and go operation as an arrival and departure by one aircraft that are separated by 3 minutes or less
- Identified operations by unique flight (tail number or call sign) and calculated time differences between adjacent arrivals and departures



Data Reduction: Aircraft Parking

- Assessed need for short-term (1-3 hours), overnight (arrival/departure separated by 1 day or more), and longer-term parking (> 3 hours but not overnight)
- Identified operations by unique flight (tail number or call sign) and calculated time differences between adjacent arrivals and departures
- Reviewed satellite photos to estimate availability of parking at each airfield



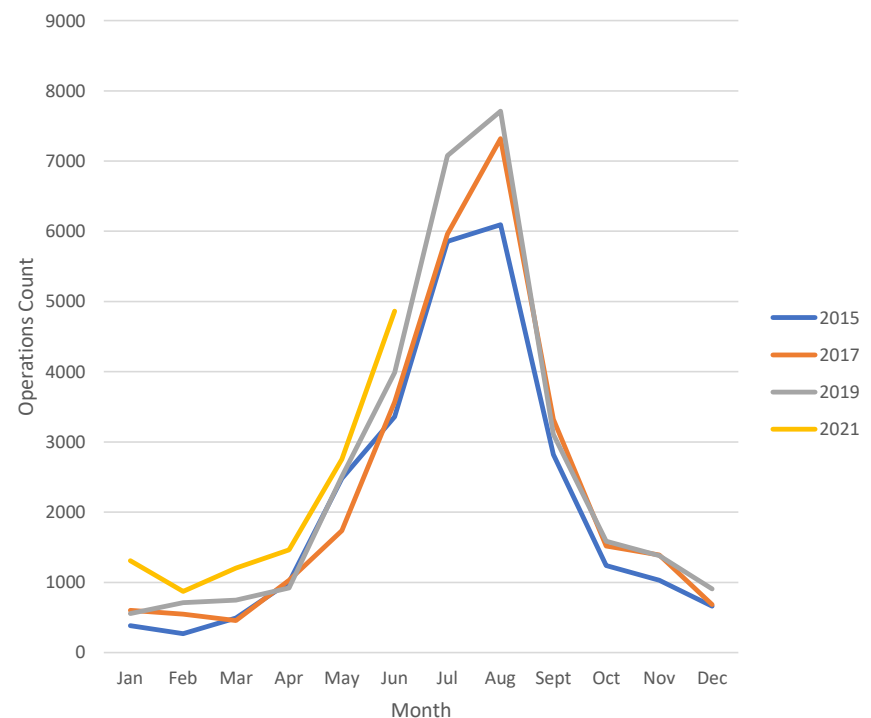
Historical Operations at East Hampton

- Used 3.5 years of data (2015, 2017, 2019, 2021 through June)
 - 98,373 total operations
 - 28,107 average annual operations
 - Primarily helicopter and piston aircraft operations

Engine Type	2015		2017		2019		2021 (Partial)		Total	
Piston	10,217	39.3%	9,977	35.2%	11,228	35.7%	5,498	43.7%	36,920	37.5%
Turboprop	5,147	19.8%	5,227	18.5%	6,140	19.5%	1,606	12.8%	18,120	18.4%
Jet	3,832	14.7%	4,459	15.8%	4,505	14.3%	2,415	19.2%	15,211	15.5%
Helicopter	6,706	25.8%	8,539	30.2%	9,577	30.4%	3,060	24.3%	27,882	28.3%
Unknown	108	0.4%	108	0.4%	14	0.0%	10	0.1%	240	0.2%
Total	26,010	100%	28,310	100%	31,464	100%	12,589	100%	98,373	100%

Historical Operations at East Hampton (2)

- Top 20 aircraft models account for ~70% of all operations
 - 7 piston aircraft, 6 helicopters, 4 jets, 3 turboprops
- Top 10 models account for ~50%
 - 5 piston, 2 helicopters, 2 turboprops, 1 jet
- Cyclical operations
 - 75% of operations between May and September
 - Peak month generally accounts for 25% of annual operations



Results



For each airport:

- Airfield Limitations
- Feasible Operations
- Additional Analysis
- Capacity Estimates
- Additional Limiting Factors



Montauk: Limitations

- Privately owned
- Runway 6/24: 3,246 ft long
 - Can support aircraft with MTOW \leq 12,500 lbs. and less than 10 passengers
- No touch and go operations
- No nighttime operations
- Jets and helicopters by prior permission
- No helicopter operations between sunset and sunrise
- Based on availability of IAPs, no operations under LIFR
- Limited aircraft parking availability
- No fuel or maintenance services

Montauk: Feasible Operations from HTO

- For entire data sample, 55,644 operations could potentially occur at Montauk
 - Annual average of 15,898 operations
- On average, from the entire data sample, 313 jets and 6,655 helicopters *could* operate at MTP
- Per FAA TFMSC, helicopters represent approximately 4% of MTP traffic and jets 0.5%
 - Could not find data sources for fleet mix aside from this
- Using these values, MTP might expect an additional 374 helicopter and 47 jet operations annually
 - Overall, could expect a total of 9,351 additional annual operations

Year	Piston and Turboprop	Jet operations	Helicopter	Total
2015	8,100	252	4,938	13,290
2017	9,114	356	7,557	17,027
2019	9,858	361	8,210	18,429
2021 (Partial)	4,185	127	2,586	6,898
Total	31,257	1,096	23,291	55,644
Average	8,931	313	6,655	15,898

Montauk: Overall Estimated Possible Increase

- Estimated existing operational rate for peak month using Form 5010 operations
 - 30,361 operations between July 2018 and June 2019
 - Peak month assumption: 7,590 monthly operations = 245 daily = 16 hourly
- Estimated operational rate required to support additional 2,338 operations for the peak month
 - Additional 75 daily operations or 5 hourly operations → 320 daily = 21 hourly
 - Approximately 1.3 times the existing rate

Montauk: Additional Limiting Factors

- Location: Disincentive for passengers traveling west of East Hampton
 - Per HR&A report, this could represent 40%+ of HTO passengers
 - Possible incentive for some of the remaining 60%
- Aircraft parking: Limited parking could be disincentive for several types of users
 - GA pilots flying themselves, some private charters
- Landing fees: MTP landing fee data not publicly available
- Airport services and facilities:
 - Limited drop-off/pick-up and vehicle parking areas could disincentivize some operations
 - Lack of passenger terminal area could disincentivize certain types of operations

Airport Limitations: Gabreski

- Publicly owned
- Has three runways, all of which can support any East Hampton operations
 - Runway 6/24: 9,002 ft long
 - Runway 1/19: 5,100 ft long
 - Runway 15/33: 5,002 ft long
- IAPs can support most IFR operations



Gabreski: Feasible Operations from HTO

- For entire data sample, 97,495 operations would be eligible at Gabreski
 - Annual average of 27,856 operations
 - Would result in an additional 6,964 operations in the peak month
 - Additional 17 operations per hour in peak month
- Estimated existing operational rate for peak month using Form 5010 operations
 - 63,302 operations in 2018 → 15,900 operations in peak month = 513 daily = 34 hourly
- Estimated total operational rate required to support additional peak month operations
 - 739 daily operations = 49 hourly
 - Approximately 1.4 times the existing rate

Gabreski: Additional Limiting Factors

- Location: Additional travel time to get to East Hampton area and points east
 - Per HR&A report, this includes approximately 60% of HTO passengers
- Landing fees: May be more expensive for certain users
 - Exact analysis was beyond this scope
- Aircraft parking: Available ramp space may not accommodate both existing FOK and additional HTO aircraft requiring parking
 - Approximately 3,125 HTO operations required some parking in the peak month



Airport Limitations: Mattituck

- Privately owned
- Runway 1/19: 2,200 ft long
 - Can support MTOW \leq 12,500 lbs. and less than 10 passengers
- No night operations
- No flight training or touch and go operations
- No IAPs, so assume no operations in IFR conditions
- Very limited paved aircraft parking
 - Unclear if much grass parking is available
- No fuel or maintenance services

Mattituck: Feasible Operations from HTO

- For entire data sample, 52,628 operations would be eligible at Mattituck
 - Annual average of 15,306 operations
- Limited aircraft parking availability
 - For short-term (< 3h), 12,592 additional annual operations
 - For no parking (< 1h), 10,934 additional estimated annual operations

Year	Piston	Turboprop	Helicopter	Unknown	Total
2015	6,110	2,753	5,650	12	14,525
2017	5,280	2,927	7,169	0	15,376
2019	5,682	3,572	8,061	0	17,315
2021 (Partial)	2,254	684	2,473	0	5,411
Total	19,326	9,936	23,353	12	52,628
Average	5,522	2,839	6,672	3	15,306

Mattituck: Overall Estimated Possible Increase

- Estimated existing operational rate for peak month using Form 5010 operations
 - 12,200 operations between July 2018 and June 2019
 - Peak month assumption: 3,050 monthly operations = 98 daily = 7 hourly
- Estimated operational rate required to support additional 4,300 operations for the peak month
 - Additional 140 daily operations or 9 hourly operations → 237 daily = 16 hourly
 - Approximately 2.4 times the existing rate

Mattituck: Additional Limiting Factors

- Location: Disincentive for most East Hampton passengers
 - 30 miles from HTO; may require ferries
 - Possible incentive for passengers traveling to destinations north of FOK
- Aircraft parking: Very limited parking could be disincentive for several types of users
- Landing fees: Landing fee data not publicly available
- Airport services and facilities:
 - Limited drop-off/pick-up and vehicle parking areas could disincentivize some operations
 - Lack of passenger terminal area could disincentivize certain types of operations



Airport Restrictions: Southampton Heliport

- Publicly owned
- Helicopters only
- Closed at night
- Based on IAPs, assume no operations in LIFR
- No parking availability
 - Assumed that arrival/departure interval > 20 minutes requires parking
- No fuel or maintenance services

Southampton: Feasible Operations from HTO

- Only helicopters can operate at Southampton (28.2% of HTO operations)
- For entire data sample, 22,896 operations would be eligible at Southampton
 - Annual average of 6,546 operations
- Additional operations would require support for 2,300 operations in peak month
 - 74 daily operations = 5 hourly operations
- Estimated existing operational rate for peak month using Form 5010 operations
 - 400 operations from October 2015 through September 2016 → 3 daily operations during peak month
- Increase to support the additional operations would be over 20x the existing rate

Southampton: Additional Limiting Factors

- Location: Disincentive for most East Hampton passengers
 - At end of peninsula near residential and county park
 - Potential difficulty and/or high cost in getting rideshare/cab service
- Airport services and facilities:
 - Limited drop-off/pick-up and vehicle parking areas could disincentivize some operations
 - Lack of passenger terminal area could disincentivize certain types of operations

Potential East Hampton Operational Limitations

- Looked at 12 options for limiting HTO operations
 - Included limitations by engine type, aircraft size, and parking
- Aside from full closure, two options could reduce annual operations by over 10,000 operations
 - No jet or helicopter operations
 - No parking (limit operations with arrival/departure separated by more than 1h)
- Other options could reduce operations by about 9,000 annual operations
 - Only allow short-term (< 3h) parking
 - Limit operations by aircraft approach speed (≤ 120 kts)
 - Limit operations by weight and passengers (MTOW < 12,500 lbs. and < 10 passengers)

Limiting Jet Operations

- Would require redistribution of 4,347 jet operations annually
- Jet operations are only feasible at Gabreski and, to a limited extent, Montauk
 - For Gabreski to accept all jet operations would require an additional 1,087 operations in the peak month (35 additional daily = 2 additional hourly → total 37 hourly operations)
 - Montauk's jet acceptance would be subject to owner approval
 - An additional 100 yearly jet operations would result in an additional 1 daily operation during peak month

Limiting Helicopter Operations

- Would require redistribution of 7,967 helicopter operations annually
- Using the 25% peak month estimate, 1,992 helicopter operations could be distributed to all four diversion sites
 - Majority of operations would likely occur at Gabreski due to limitations at other airfields
 - Southampton: Tripling existing operations to 9 per day would account for 279 peak month operations (0.6 hourly operations total)
 - Mattituck: Has limited helicopter operations according to TFMSC—assumed an additional 1.5 daily operations during peak month, for 47 operations (6.7 hourly operations total)
 - Montauk: Assumed an additional 1 hourly operation during peak month, for 484 peak month operations (17 hourly operations total)
 - Gabreski: Remaining 1,882 operations → 38 additional daily = 2.5 hourly (36.7 hourly operations total)

East Hampton Closure

- Would require redistribution of 15,794 piston, turboprop, and unknown/other average annual operations, in addition to the jet and helicopter operations previously discussed
- Distributed these operations among the three airports in general proportion to existing operation counts
 - 1,442 additional operations at Montauk (46 daily = 3.1 hourly = additional 20%)
 - 261 additional operations at Mattituck (8 daily = 0.6 hourly = additional 9%)
 - 2,245 additional operations at Gabreski (72 daily = 4.8 hourly = additional 14%)
- Overall additional operations (piston, turboprop, helicopter, jet, other)
 - Montauk: 2,026 in peak month → 20.7 total hourly operations required to support HTO closure
 - Gabreski: 4,415 in peak month → 43.7 total hourly operations
 - Mattituck: 308 in peak month → 7.2 total hourly operations
 - Southampton: 279 in peak month → 0.6 total hourly operations

Parking Limitations

- Looked at eliminating all aircraft parking, eliminating overnight parking, or only allowing short-term parking
 - Analysis considers “parking” to include any aircraft with an arrival/departure time difference of > 1h
 - Analysis does not identify aircraft based at HTO, so the actual numbers for operations reductions are elevated
 - The study extent did not include identification of based aircraft and their operations
- Removing the option to park at HTO could reduce annual operations by nearly 12,000

Parking Limitations: Overnight/Short-Term

- Limiting overnight parking would require relocation of 5,583 operations annually
 - Most of these would have to go to Gabreski due to overnight parking availability at other airfields
 - Analysis does not differentiate between HTO-based aircraft and transient aircraft
- Limiting operations to those requiring no or short-term parking would require relocation of 8,547 annual operations
- For the peak month, 3,513 operations would require parking (114 daily operations)
 - 40% of East Hampton operations require parking
 - The same rate at Gabreski puts its parking baseline at 209 peak month operations
 - Gabreski would need to support parking for 323 daily operations

Other Limitation Options

- Most other options would divert traffic to Gabreski
 - Limitations based on weight and/or passengers would likely use Gabreski
 - Aircraft with approach speeds > 120 kts could also only use Gabreski's runways
 - Touch-and-go/training traffic also limited to Gabreski
- These options would require Gabreski to support up to 9,000 additional annual operations
 - Approximately 2,250 additional peak month operations = 73 daily = 5 hourly

Summary

- All proposed diversion airfields could support some level of traffic from East Hampton if the airport were to close or otherwise limit operations
- Gabreski would likely receive the bulk of operations since it provides similar services and facilities to East Hampton
 - To support all East Hampton operations, Gabreski would have to handle 44% more traffic
 - Limiting factor is likely aircraft parking
- Montauk could support a limited number of East Hampton operations
 - If it supported all the flights that could operate there, it would handle 34% more traffic
- Mattituck and Southampton could support a very limited number of operations from East Hampton
- External factors would likely lead to passengers and/or operators electing to forego trips or switch to other modes of transit
 - Additional research regarding economic choice and cost/benefit analysis is likely necessary to fully understand the number and types of operations that would still occur

Backup Slides

Flight Operations Data

- Flight operations data were obtained from the Airport's Vector Operations Management System (VNOMS)
 - Full calendar years 2015, 2017, 2019
 - First half of 2021
- Includes
 - Date and time
 - Aircraft model and engine type
 - Landing and takeoff weight

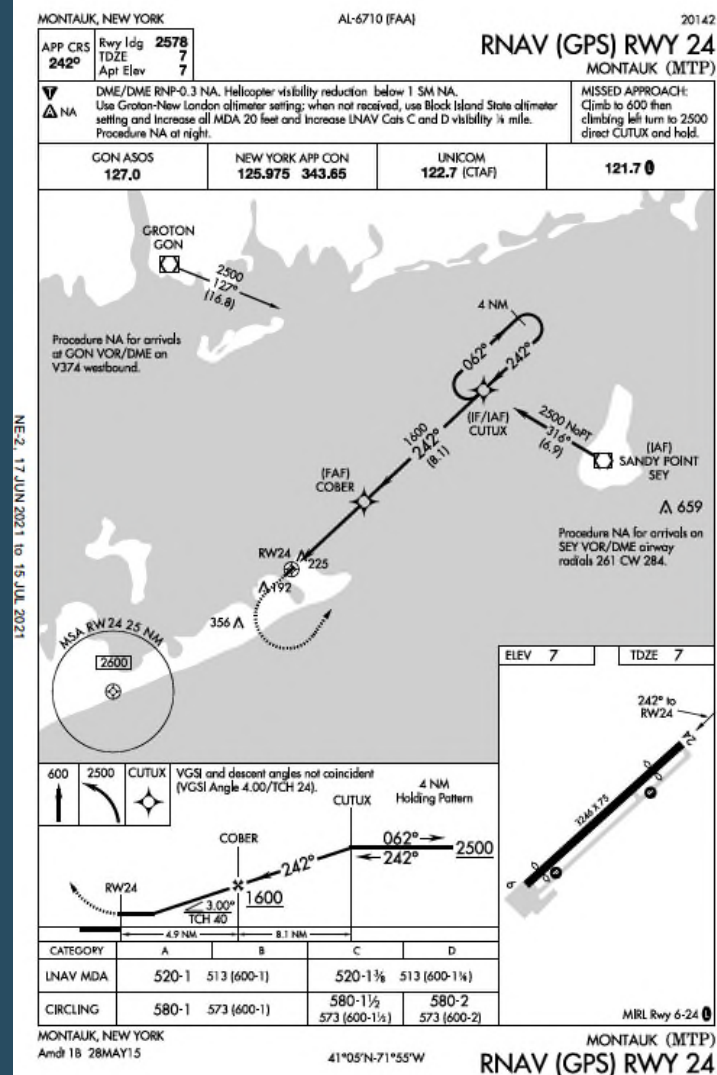


Aircraft Data

- Obtained from FAA Aircraft Characteristics Database and aircraft manufacturer data
- Includes
 - Maximum takeoff weight (MTOW)
 - Aircraft stall and/or approach speeds
 - Number of seats

Airport Data

- FAA Form 5010 data (available for each airport)
 - Runway heading, length, and width
 - Airport ownership
 - Airport restrictions
 - Annual airport operations
- FAA Instrument Approach Procedures
 - Visibility and ceiling requirements according to aircraft approach speed
 - Other approach limitations
- FAA Traffic Flow Management System Counts (TFMSC)
 - Annual airport operations
 - Airport fleet mix/engine types



Meteorological Data

- Hourly weather reports obtained from NOAA
- Includes
 - Wind speed and direction
 - Cloud height (ceiling) and cloud cover status
 - Visibility
- Some airports do not have weather reporting stations
 - In this case, pilots rely on weather reports from nearby airports with these stations
 - Montauk, Mattituck, and Southampton are such airports
 - Mattituck and Southampton use weather from East Hampton and/or Gabreski
 - Montauk uses weather from Block Island (RI) and/or Groton (CT)

Other Data

- Historical sunrise/sunset data from NOAA
- Satellite imagery from Google Maps
- Airport facility data
- HR&A Preliminary Economic Impact Analysis (May 2021)



Quantitative Study Questions

- How many of East Hampton's operations could *feasibly* operate at each of the diversion airfields?
 - Can an operation safely land given an airfield's runway length?
 - Can an operation occur at an airfield given its restrictions on type of operations?
 - Can an operation occur based on estimated weather conditions at an airfield?
 - Ceiling, visibility, crosswinds
 - Would an operation require parking, and would an airfield be able to support that?
 - Parking duration, parking availability
- How would this estimate of additional operations compare to existing operations for each airfield?

Qualitative Study Questions

- For each airfield, *would* a pilot or operator choose to use that airfield instead of East Hampton?
 - Location and access
 - Landing fees
 - Rental car, rideshare, taxi, public transit access
 - Passenger destination
- Limited data availability on these items as they require insight into passenger/pilot cost-benefit criteria

Montauk: Prior Permission

- On average, 313 jets and 6,655 helicopters *could* operate at MTP
 - These would require prior permission
 - Actual acceptance depends on owner's goals for the airport
- Helicopters represent ~4% and jets ~0.5% of operations at MTP
 - Data obtained from FAA Traffic Flow Management System Counts (TFMSC)
 - These values may not align with actual operations but did not find any other sources
- Using these values, MTP might expect an additional 374 helicopter and 47 jet operations annually
 - Overall, could expect a total of 9,351 additional annual operations

Mattituck: Parking Availability

- Airport could possibly support short-term (up to 3 hours) parking
 - Would result in 12,592 additional annual operations
- 10,934 additional estimated annual operations would result for operations that remain on the ground for less than an hour
- 4,300 estimated additional operations in peak month → 140 daily operations = 9 hourly